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179

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CEREAL DISEASES

BACTERIAL WILT OF SWEET CORN IN IOWA - 1932

R. H. Porter

Bacterial wilt was probably first observed in Iowa as of commercial importance in 1928, in the southeast corner of the State. Since that time it has been on the increase and was particularly severe in 1932. Several localities sent specimens for the first time, particularly from Jones, Lucas, and Dallas Counties. In the vicinities of Cedar Rapids, Des Moines, Oskaloosa, and Fort Madison severe losses were incurred by market gardeners. In a few places the damage was easily 50 per cent. One interesting condition noted was that in at least three localities it appeared only in fields where seed was purchased directly from outside the State. In one case it appeared on Canada Flint secured from New York State, in another on Golden Sunshine from a Chicago seed house and in a third instance in Dallas County on a farm where the seed was purchased directly from a seed house in Ohio. A sample of each lot of seed was secured and greenhouse tests have shown unmistakably that each seed lot is infected with Bacterium stewartii. We have apparently succeeded in working out a method for the detection of this organism in sweet corn seed by our seed laboratory.

On the other hand numerous cases have come to our attention where the main source of infection was apparently the soil rather than seed and of course there is high probability of spread by insects.

In the spring of 1932 seed from a hybrid and an inbred line of sweet corn was secured from Glen M. Smith at LaFayette, Indiana. In addition 20 pounds of a cross between Golden Sunshine and one of Smith's inbreds was secured from a seed company in Iowa. Each of these three lots was planted

beside a susceptible variety in six counties where wilt has been prevalent. Observations during early August showed that all three selections developed decidedly less wilt than known susceptible varieties. None of them escaped wilt but the growers reported good returns and a higher quality of corn than they had ever used before. There is hope for a reasonable control of this disease by the use of partially resistant strains of early maturing sweet corn.

We are now studying the resistance of several hybrids and inbreds produced by the local departments of Horticulture and Genetics. In addition we expect to start growing wilt-free seed in areas of the State where wilt has never been reported. With a supply of resistant, disease-free seed, supplemented by crop rotation and crop sanitation it is hoped that this disease can be satisfactorily controlled.

SEED TREATMENT FOR DRY ROTS OF CORN IN IOWA - 1932

R. H. Porter

We have just completed the sixth year of field tests in Iowa using organic mercury dusts on farmers' planter-box corn. We planted some of the plots by hand and some with corn planters. The total number of plots was 24 in 9 different counties. The dusts used were Merko, Semesan Jr., and Barbak III. Seed from open pollinated, standard varieties, from hybrids and from topcrosses were included in the tests. In one series where we had early maturing, medium maturing varieties and hybrids the average increases from three dusts were 4.9, 4.1, and 4.9 bushels respectively for the varieties listed above. In previous years hybrids have responded with the highest increase and early maturing varieties with the lowest. The weighted average increase for all varieties in all counties this year due to seed treatment was 5.1 bushels, the highest figure obtained in the six-year period. The gains for previous years have been as follows: 1927, 4.0 bushels; 1928, 2.8 bushels; 1929, 4.4 bushels; 1930, 3.3 bushels; 1931, 4.0 bushels. The average for the six-year period is 3.9 bushels per acre. This gain has been secured at a cost of about 4 cents per acre.

In the years 1928, 1929, and 1930, reasonably reliable estimates showed that approximately 40 per cent of the corn acreage of the State was planted with treated seed. This meant an increase of approximately 40,000,000 bushels for the three-year period valued at around $20,000,000. The actual cost of the practice in money was less than $600,000.

In 1931 and 1932 the practice of seed treatment decreased, largely due to lack of money for the purchase of materials but even in 1932 with corn at 10 cents a bushel the man who got an average gain of 5 bushels at a cost of 4 cents made a good profit. Obviously the few extra bushels put on by seed treatment make the farmer the most profitable returns. We are confident that in the new readjustment of production which must come, seed treatment of corn in the corn belt area must be included as an important part of a corn production program because it will contribute toward efficient production.

The gains from seed treatment of corn in 1932 are due to two factors, (1) weather conditions in the fall of 1931 were favorable for the development of dry rots in the field and even on corn gathered for seed but not properly dried or protected and (2) favorable soil temperatures and abundant moisture during the major portion of the planting season in 1932.

In addition to results secured from seed treatment we have carried on tests with early and late selected seed, diseased seed and nearly disease-free seed since 1922. We have concluded that early seed selection just prior to the first killing frost, followed by rapid drying and good storage furnish a seed supply which when treated will yield practically as much as nearly disease-free, treated seed. Our program now is one of urging farmers who have selected and cared for their seed to select from 100 to 200 ears from their seed lot which they consider fit to plant, remove 6 kernels from each ear and then either make a test at home or send it to our seed laboratory. If the test shows less than 2 per cent dead kernels and over 90 per cent strong germination, then the important thing is not an individual ear test but careful visual selection while shelling the seed and seed treatment before planting.

WHEAT BUNT SURVEY IN GALLATIN COUNTY, MONTANA, IN 1932

Paul A. Young

Data on the time of planting of 69 fields of wheat covering 7,970 acres were secured in August to October, 1931. The percentages of bunt in these fields were determined in July and August, 1932. This detailed survey was conducted in order to obtain accurate data on the effectiveness of treating chemicals in controlling stinking smut, and the responsibility of soil infestation (inoculation) by Tilletia for increasing the percentages of stinking smut in winter wheat fields.

The fall of 1931 was very favorable for infection by Tilletia. Most of the wheat planted in September before the first rain on the nineteenth was planted in such dry ground that it did not emerge until the first week of October. After the rain on September 19, the rest of the fall weather had predominating temperatures around 30 to 60° F. (especially soil temperatures), which were favorable for infection. Percentages of bunt are less in fields in which the wheat germinates and emerges at temperatures of 65 to 85°F.

Tilletia levis predominated in Gallatin County. T. tritici was found in two fields, one with 2.7 per cent and one with 49 per cent infection.

The accompanying table (Table 30) summarizes the data secured on the effectiveness of seed treatment.

The high percentages of smut in fields planted with chemically-treated seed were due to three main causes: (1) use of obviously smutty seed, (2) unusually favorable weather for infection by Tilletia, and (3) inoculation

Table 30. Effectiveness of seed treatments in controlling stinking smut of winter wheat in regions of Gallatin County, Montana, where Tilletia inoculates the summer fallow.

Treatment used	Number of fields	Acres	Range of infection (per cent)	Acres x percentage of bunt	Weighted average percentage of bunt
50 % $CuCO_3$	25	3,407	0.1 - 34.2	370.428	10.9
Ceresan	5	785	0.1 - 16.8	29.935	3.8
$CuSO_4$	18	1,363	0.1 - 25.3	59.221	4.3
Formaldehyde	13	1,432	0.1 - 35.0	191.405	13.4
None	5	678	7.3 - 49.0	151.743	22.4

Fields all of Turkey wheat except two of Jones Fife, one treated with 50% $CuCO_3$ with 1.3 per cent smut; one treated with formaldehyde, with 1.2 per cent.

of the summer-fallow by spores from neighboring smutty fields during threshing, and planting wheat in these inoculated fields before the Tilletia spores died. Soil inoculation by Tilletia spores very probably increased the percentages of bunt in many of these fields. Soil inoculation was serious in the Accola region of this County. The treating chemicals used generally control stinking smut when they are applied to wheat seed not obviously smutty, when soil inoculation is negligible, and when the wheat can germinate and emerge during temperatures of 65 to 85° F. Control of soil infestation by Tilletia is a community project.

VEGETABLE DISEASES

A FIELD SURVEY OF SWEETPOTATO DISEASES IN VIRGINIA

Paul R. Miller

A cooperative sweetpotato disease survey between the United States Department of Agriculture and the Virginia Experiment Station was made at intervals during the growing season of 1932 for the purpose of obtaining further information on the relation of cultural practices and storage conditions to the losses due to diseases. For storage diseases see P. D. R. 16: pp. 19, 20. The data obtained is recorded in Table 31.

Table 31. Sweet potato diseases found in the field in Virginia during the growing season of 1932.

County	Number of Growers	Number Acres Examined	Amt. of Disease	DISEASES: Black Rot No. Lots	Scurf No. Lots	Soft Rot No. Lots	Blue Stem No. Lots	Foot Rot No. Lots	Pox No. Lots	Harvest Injury No. Lots	Leaf Spot P.	Leaf Spot R.	Leaf Spot S.
Accomac	17	168	Θ*										
			+		1		1		1				
			V		6	1	6			2	4	1	
			–	3		2	3		3		2		–
			Θ							1			
Nansemond	12	45	Θ	1	1								
			+										
			V								1		
			–	1	2		4		1	2	2		
			Θ		1						3		
Northampton	18	147	Θ				1						
			+		1								
			V	1			1	1		1			
			–		3		4		2		3	1	2
			Θ							3			
Princess Ann	21	209	Θ				1						
			+							2			
			V	1	5								
			–	4	2				1	2	1	1	
			Θ	7			3	3				1	
Total	68	569											

Θ – Very Severe – 10 to 100%
\+ – Severe – 5 to 10%
V – Moderate – 2 to 5%
– – Slight – 1 to 2%
Θ – Very Slight – Less than 1%

P. Phyllosticta
R. White Rust
S. Septoria

It was apparent from examining the same growers' sweetpotatoes in the fields and in storage that there is a close correlation between the severity of diseases in storage and the cultural and handling practices, especially the rough handling during harvesting.

TOMATO LATE BLIGHT IN CONNECTICUT

Phytophthora infestans on tomatoes, especially on the fruit, was one of the most important diseases in Connecticut. We have seen it occasionally before, but this year it was general and serious on late tomatoes, especially Marglobe. (G. P. Clinton, Nov. 17).

DISEASES OF ORNAMENTALS

COMPARATIVE SUSCEPTIBILITY OF CARNATION VARIETIES TO RUST

E. F. Guba

The following list reports observations on the susceptibility of carnation varieties to rust (Uromyces caryophyllinus) at the Waltham Field Station, Massachusetts, during 1932. The varieties starred are grown commercially in Massachusetts.

Very susceptible		Moderately susceptible	Slightly susceptible	Resistant
Super Supreme	Radiolite	White Delight	*White Eldora	*Spicy White
*Woburn	*Sceptre	Multiflora	*Dandy	*White Matchless
*Salmon Spectrum	Uneeda Pink	Dorner's Surprise	*Fairy Queen	*Pink Eldora
Edna	*Boston Ward	*Harvester	Royal	*Sophiella
Hilda	Arctic	Aviator	*Gloria	Katrine
*Senator	*Spectrum		*Pink Abundance	*Pink Matchless
Winsome	*Mrs. C. C. Ward			Morning Glow
Pink Delight	*Rosalind			*Ivory
	*Betty Lou			

MARKET PATHOLOGY NOTES

DISEASES FOUND ON CHICAGO MARKET

G. R. Ramsey

Apples: It is not often that we have much Brown Rot (Sclerotinia fructicola) on apples received on the Market, but this year there seems to be an exceptional amount of infection in the Wolf River variety shipped from New York State. Two cars of this variety have come to my attention in which the decay ranged from 6 per cent to 20 per cent, averaging about 13 per cent. The decay was noted in various stages but in the majority of instances, lesions from one to two inches and larger were observed on many fruits.

We have had an unusual amount of injury to apples from Idaho this year which is definitely associated with the washing and handling practices. In many lots from 10% to 25% of the fruit were seriously spotted, or had general surface browning, which seriously affected the marketability of the stock.

Cabbage: Wisconsin cabbage, taken directly from the field, has shown an appreciable amount of Black Leaf Speck. Generally this physiological trouble appears after the stock has been placed in storage, but apparently field conditions have been favorable for its development and the symptoms have become manifest earlier than ordinary.

Potatoes from certain localities in Wisconsin have shown a high percentage of Fusarium Stem-end Rot, associated with Wilt. Some lots coming to our attention have shown from 10 per cent to 40 per cent of stock so affected.

Idaho potatoes have shown a slight amount of Jelly-end Rot this season. In some lots Leak has also been noted, affecting as high as 20 per cent of the stock. Neither of these two diseases has been found causing serious trouble on the Chicago market during the past few years.

Tomato: California tomatoes seem to have been affected to an unusual extent by virus diseases this season. Streak and Mosaic have been observed on market stock. Puffiness and watery condition of thin walled fruit have been very detrimental to market quality.

A slight amount of Pleospora Rot has been observed in November shipments of tomatoes from California. This disease appears about the same time each year and frequently causes serious damage, but has never been described in literature, so far as I can determine. I have had this disease under observation since 1919 and am expecting to write up my findings within the near future.

Peppers: Gray Mold Rot (Botrytis) is taking a heavy toll in some of the California shipments of peppers during the past few weeks. A few lots showing as high as 20 per cent have been observed. (Nov. 14).

M I S C E L L A N E O U S N O T E S

LOSSES FROM DISEASE IN IOWA

R. H. Porter reports that losses from certain diseases have been heavy this year, partly due to weather conditions and partly to lack of funds with which to purchase seed treatment materials. In the former category are anthracnose of cucurbits, downy mildew of cantaloupes, bacterial blight of barley, apple scab, leaf spot and phoma rot of sugar beets, corn smut and bacterial blight of beans. In the latter group are oat smut and barley stripe.

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PLANT DISEASE REPORTER

INDEX TO VOLUME XVI

1932

Prepared by Nellie W. Nance

ABIES AMABILIS, Dimerosporium sp., 34.
Herpotrichia nigra, 39.
Hypoderma robustum, 30.
Hypodermella nervisequia, 31.
ARIZONICA, Hypoderma abietis, 29.
BALSAMEA, Chilonectria balsamea, 39.
cucurbitula, 39.
Cytospora abietis, 41.
curreyi, 42.
pinastri, 39.
Dimerosporium balsamicola, 34.
Gloeosporium balsameae, 34.
Hypodermella macrospora, 31.
nervisequia, 31.
Leptothyrium pini, 34.
Lophodermium abietis, 31.
Nectria coccinea, 40.
Phacidium abietinellum, 36.
Phoma sp., 40.
Valsa avietis, 41.
brevis, 42.
pini, 42.
CONCOLOR, Cytospora abietis, 42.
Herpotrichia nigra, 39.
Hypoderma robustum, 30.
Hypodermella abietis-concoloris, 30.
macrospora, 31.
nervisequia, 31.
Lophodermium abietis, 31.
Phacidium balsameae, 36.
infestans abietis, 36.
Phoma sp., 40.
Rehmiellopsis bohemica, 168.
FRASERI, Hypodermella abietis-concoloris, 30.
nervisequia, 31.
Rhabdogloeum abietinum, 37.
ABIES GRANDIS, Cytospora abietis, 42.
Dimerosporium sp., 34.
balsamicola, 34.
Herpotrichia nigra, 39.
Hypoderma robustum, 30.
Hypodermella macrospora, 31.
nervisequia, 31.
Lophodermium abietis, 31.
Macrophoma parca, 35.
Phacidium infestans abietis, 36.
Phaeophacidium abietinum, 40.
Phoma abietis, 37.
Valsa abietis, 41.
pini, 42.
LASIOCARPA, Herpotrichia nigra, 39.
Hypoderma abietis, 29.
Hypodermella macrospora, 31.
nervisequia, 31.
Lophodermium abietis, 31.
Macrophoma parca, 35.
Phacidium balsameae, 36.
infestans abietis, 36.
Valsa abietis, 41.
NOBILIS, Herpotrichia nigra, 39.
PECTINATA, Phoma pectinata, 37.
ACACIA FILICULOIDES, Nummularia clypeus, 139.
ACER JAPONICUM, Cuconema radicicola, 55.
ACONITE, root and crown rot, 148.
Actinomyces scabies, potato, 121, 136.
Agropyron repens, Urocystis agropyri, 138.
AILANTHUS, Verticillium wilt, 97.
ALBIZZIA JULIBRISSIN, Tubercularia vulgaris, 138.
ALFALFA, bacterial wilt, 151.
black stem, 88.

ALFALFA, crown rot, 89.
Tylenchus dipsaci, 2.
violet root rot, 75.
ALLIUM CEPA, Tylenchus dipsaci, 77.
SATIVUM, Tylenchus dipsaci, 77.
Alternaria, asparagus, 167.
Alternaria sp., celery, 44.
tobacco, 145.
solani, potato, 45, 121, 136.
tomato, 144, 174, 175.
AMARYLLIS JOHNSONI, see Hippeastrum johnsoni.
AMSINCKIA INTERMEDIA, Tylenchus dipsaci, 77.
ANDROMEDA GLAUCOPHYLLA, rust, 126.
ANDROPOGON VIRGINICUM, Sphacelotheca seymouriana, 138.
Angular leaf spot, see bean, tobacco.
Anthracnose, see under fungus names and bean, cucurbits, dewberry, raspberry, red clover. Ribes spp., rye, watermelon.
Aphanomyces euteiches, pea, 174.
raphani, radish, 137.
Aphelenchoides fragariae, nerine, 169.
Phlox decussata, 137.
strawberry, 113.
Aphelenchus fragariae, iris, 68.
subtenuis, narcissus, 54.
Aplanobacter insidiosum, alfalfa, 151.
michiganense, tomato, 121, 144, 174, 175.
stewartii, corn, 134, 149, 150, 170, 179.
sweet corn, 104, 114, 140, 141, 142, 167, 174.
Aposphaeria fibricola, Juniperus monosperma, 38.
pinea, Pinus strobus, 38.
APPLE, bitter pit, 14.
bitter rot, 162.
black rot, 11.
blight, 87, 91, 105, 118, 154.
blotch, 11.
Brooks spot, 11.
brown rot, 184.
Cedar rust, 23.
collar rot, 118.
crown gall, 133.
Dothiorella, 119.
drought, 118.
APPLE, freezing injury, 46.
frog eye leaf spot, 87, 108.
injury, 185.
leaf blight, 178.
leafspot, 119.
mildew, 94.
powdery mildew, 119.
quince rust, 158.
russet, 131.
rust, 11, 133, 158.
scab, 10, 11, 22, 47, 71, 86, 94, 106, 185.
soft scald, 18.
sooty blotch, 11.
stem canker, 178.
Apple rust, cedar, 72, 108.
Ascochyta spp., pea, 174.
piniperda, Picea sp., 39.
pisi, Austrian winter pea, 74.
viciae, Vicia sp., 137.
Ashy stem blight, snap bean, 138.
ASPARAGUS, Alternaria, 167.
Penicillium sp., 1.
tip wilt, 167.
Asterina pinastri, Pinus caribaea, 33.
echinata, 33.
ponderosa, 33.
rigida, 33.
strobus, 33
taeda, 33.
ASTER, yellows, 130, 169.
ASTILBE ARENDSII, Erysiphe polygoni, 138.
ASTRAGALUS SINICUS, Caconema radicicola, 54.
AVENA SATIVA, Tylenchus dipsaci, 77.

B

Bacillus amylovorus, apple, 87, 91, 105, 118, 154.
Cotoneaster spp., 145.
pannosa, 130.
racemiflora, 148.
pear, 88, 91, 105, 118, 154.
quince, 154.
carotovorus, 142.
carrot, 18.
potato, 73.
tobacco, 8.
phytophthorus, potato, 73, 121.
Bacterial blight, see barley, bean, lima bean, pea.

Bacterial canker, tomato, 121, 144, 174, 175.
diseases, abundance of, 151.
gummosis, stone fruits, 133.
leaf blight, corn, 149.
leaf spot, see nasturtium, peach, squash, tobacco.
rot, carrot, 18.
spot, see cabbage, cauliflower, lima bean, peach, tomato.
wilt, see alfalfa, corn, sweet corn.
Bacterium angulatum, tobacco, 6, 8, 90.
aptatum, 169.
nasturtium, 125.
campestre, cabbage, 178.
cauliflower, 178.
cucurbitae, squash, 176.
dissolvens, sweet corn, 142.
maculicolum, cabbage, 178.
cauliflower, 178.
medicaginis phaseolicola, bean, 88.
phaseoli, snap bean, 173.
pisi, pea, 174.
pruni, peach, 87, 133.
stone fruits, 133.
solanacearum, peanut, 163.
potato, 121.
tobacco, 8.
stewartii, see Aplanobacter.
tabacum, tobacco, 90, 96, 122.
tolaasi, mushroom, 25.
tumefaciens, blueberry, 73, 155.
vesicatorium, tomato, 103, 121, 144, 174.
vignae, lima bean, 153, 173.
BARLEY, bacterial blight, 185.
covered smut, 6, 70.
loose smut, 6.
scab, 143.
stripe, 89, 185.
yellow leaf, 89.
BEAN, angular leaf spot, 165.
anthracnose, 165, 173.
ashy stem blight, 138.
bacterial blight, 165, 173, 185.
cold injury, 122.
halo blight, 88, 165.
hydrosis, 165.
BEAN, hydrosis, 165.
mosaic, 165, 173.
root rot, 173.
stem rot, 88.
BEAN, LIMA, bacterial blight, 153.
bacterial spot, 173.
downy mildew, 173.
pod blight, 173.
root rot, 173.
BIGNONIA CAPREOLATA, Caconema radicicola, 55.
Bitter pit, apple, 14.
Bitter rot, apple, 162.
Black knot, plum, 120.
Black leaf speck, cabbage, 185.
Black leg, see cabbage, cauliflower, potato.
Black root, radish, 137.
Black root rot, tobacco, 7.
Black rot, see apple, cabbage, cauliflower, grape, pineapple, squash, sweet potato.
Black shank, tobacco, 9.
Black stem, alfalfa, 88.
BLACKBERRY, double blossom, 3, 4.
Blight, see apple, Cotoneaster spp., Cotoneaster pannosa, Cotoneaster racemiflora, pea, pear, quince.
Blossom-end rot, tomato, 144, 175.
Blotch, apple, 11.
walnut, 162.
BLUEBERRY, crown gall, 73, 155.
Blue mold, orange, 18.
tobacco, see downy mildew.
Blue stem, sweet potato, 183.
Botryosphaeria ribis, Sterculia platanifolia, 138.
Botrytis sp., celery, 44.
peanut, 164.
pepper, 185.
strawberry, 118.
cinerea, potato, 15.
rose, 137.
BOX, Volutella buxi, 138.
Briosia ampelophaga, grape, 154.
Brome smut, Bromus unioloides, 111.
BROMUS UNIOLOIDES, brome smut, 111.
Cephalobus elongatus, 2.
oxyuroides, 2.
Dorylaimus sp., 2.

BROMUS UNIOLOIDES, Pathoaphelenchus parietinus, 2.
Tylenchus dipsaci, 2.
Brooks spot, apple, 11.
BROUSSONETIA PAPYRIFERA, Thyridaria eutypoides, 139.
Brown root rot, tobacco, 9.
Brown rot, apple, 184.
cherry, 120.
orange, 130.
potato, 121.
Brown rot blossom blight, peach, 111.
Brown sprout, potato, 104.
Bruise spot, mushroom, 25.
Buckeye rot, tomato, 175.
Bud blight, rose, 137
Bunt, wheat, see stinking smut.

C

CABBAGE, bacterial spot, 178.
black leaf speck, 185.
black leg, 178.
black rot, 178.
cold injury, 122.
downy mildew, 153.
Caconema radicicola, 16, 17.
Acer japonicum, 55.
Astragalus sinicus, 54.
Bignonia capreolata, 55.
Coronilla varia, 3.
Echinochloa crus-galli, 146.
Hedychium gardnerianum, 137.
Oryza sativa, 146.
Polygonum lapathifolium, 146.
potato, 2.
tobacco, 8.
Caliciopsis pinea, Pinus pungens, 39.
rigida, 39.
strobus, 39.
virginiana, 39.
CANNA INDICA, Physalospora malorum, 139.
Cane blight, raspberry, 48.
CANTALOUPE, cold injury, 122.
downy mildew, 185.
Macrosporium cucumerinum, 136.
see also muskmelon.
CARNATION, rust, 184.
CARROT, bacterial rot, 18.
leaf blight, 176.
Caryospora callicarpa, oak, 139.
CAULIFLOWER, bacterial spot, 178.
black leg, 178.
black rot, 178.
CEDAR, apple rust, 72, 108.
hawthorn rust, 133.
quince rust, 72.
Cedar rust, apple, 23.
CELERY, Alternaria, 44.
Botrytis, 44.
early blight, 43, 178.
frost injury, 2.
late blight, 177.
Phoma root rot, 1.
yellows, 18.
Center rot, tomato, 151.
Cephalobus, Narcissus poeticus, 112.
elongatus, Bromus unioloides, 2.
oxyuroides, Bromus unioloides, 2.
Cephalosporium, elm, 125.
Cercospora apii, celery, 178.
fusca, pecan, 145.
nicotianae, tobacco, 8, 145.
personata, peanut, 164.
CEREALS, leaf rust, 89.
CHAMAECYPARIS THYOIDES, Nectria thujina, 40.
Valsa abietis, 41.
CHAMAEDAPHNE CALYCULATA, rust, 126.
Charcoal rot, sweet potato, 20.
CHERRY, brown rot, 120.
Penicillium, 120.
Cherry-red leaf, tobacco, 9.
Chilonectria balsamea, Abies balsamea, 39.
cucurbitula, Abies balsamea, 39.
Picea engelmanni, 39.
mariana, 39.
Pinus nigra austriaca, 39.
rigida, 39.
strobus, 39.
virginiana, 39.
CHIONODOXA, Tylenchus dipsaci, 169.
CHRYSANTHEMUM, Pathoaphelenchus ritzemabosi, 3.
CIRSIUM LANCEOLATUM, Tylenchus dipsaci, 79.
Cladosporium sp. peony, 123.
carpophilum, peach, 155.
fulvum, tomato, 135, 153, 175.
paeoniae, peony, 123.
Cloudy spot, tomato, 167.
CLOVER, crown rot, 24.

CLOVER, RED, anthracnose, 89.
crown rot, 89.
stem rot, 89.
Coccomyces pini, Pinus excelsa, 39.
monticola, 39.
strobus, 39.
COLCHICUM SPECIOSUM ALBUM, Tylenchus dipsaci, 146.
Cold injury, bean, 122.
cabbage, 122.
cantaloupe, 122.
cucumber, 122.
onion, 122.
potato, 122.
squash, 122.
tobacco, 90.
tomato, 122.
watermelon, 122.
Coleosporium solidaginis, Pinus resinosa, 178.
Collar rot, apple, 118.
tomato, 175.
Collenema sp., Larix occidentalis, 33.
Colletotrichum graminicolum, rye, 50.
lagenarium, watermelon, 177.
lindemuthianum, bean, 165, 173.
CONIFERS, needle blight, 29.
Valsa, 42.
Coniothyrium diplodiella, grape, 124.
rose, 124.
CORALBERRIES, violet root rot, 74.
CORN, bacterial leaf blight, 149.
bacterial wilt, 134, 140, 149, 150, 170.
dry rot, 180.
seed treatment, 180.
smut, 185.
see also sweet corn.
CORONILLA VARIA, root-knot, 3.
Corticium stevensii, apple, 178.
vagum, potato, 121.
tobacco, 8.
Coryneum sp., dewberry, 137.
cinereum, Pinus contorta, 33.
cupulatum, Tsuga canadensis, 39.
juniperinum, Juniperus communis, 34.
thujinum, Thuja plicata, 34.
COTONEASTER SPP., blight, 148.
PANNOSA, blight, 129.
RACEMIFLORA, blight, 148.
Covered smut, barley, 6.
oats, 142.
wheat, 105.
Cracked seed, peach, 119.
Cracking, watermelon, 22.
CRANBERRY, decay, 12.
false blossom, 93, 154.
frost control, 93.
fruit rot, 93.
keeping quality, 12, 153.
leaf drop, 93.
rose bloom, 92.
CREPIS CAPILLARIS, Tylenchus dipsaci, 79.
Crown gall, apple, 133.
blueberry, 73, 155.
Crown rot, alfalfa, 89.
clover, 24.
red clover, 89.
Cryptosporium candidum, Pseudotsuga taxifolia, 39.
CUCUMBER, cold injury, 122.
downy mildew, 152, 177.
CUCURBITS, anthracnose, 185.
Curly top, tomato, 136.
CYCLAMEN, Tylenchus pratensis, 17.
Cylindrocarpon, narcissus, 112.
Cylindrosporium caryigenum, pecan, 146.
rubi, 137.
Cytospora abietis, Abies balsamea, 41.
concolor, 42.
grandis, 42.
Larix occidentalis, 42.
Pinus ponderosa, 42.
Pseudotsuga taxifolia, 42.
Cytospora canker, blue spruce, 155.
elm, 125.
chrysosperma, elm, 125.
curreyi, Abies balsamea, 42.
Tsuga canadensis, 42.
pinastri, Abies balsamea, 39.
Pinus strobus, 39.
sylvestris, 39.
pini, Pinus contorta, 42.
monticola, 42.
thujae, Thuja occidentalis, 42.
weiriana, Thuja plicata, 42.

D

DAHLIA, Vermicularia compacta, 139.

Damping-off, tobacco, 16.
tomato, 175.
DANTHONIA SPICATA, Ustilago residua, 111.
Decay, cranberry, 92.
DELPHINIUM, root and crown rot, 148.
TROLLIIFOLIUM, Tylenchus dipsaci, 80.
DEWBERRY, Anthracnose, 13.
Coryneum sp., 137.
double blossom, 4.
DIANTHUS BARBATUS, Tylenchus dipsaci, 80.
Diaporthe phaseolorum, lima bean, 173.
Didymella applanata, raspberry, 48.
Dimerosporium sp., Abies amabilis, 34.
grandis, 34.
balsamicola, Abies balsamea, 34.
grandis, 34.
Picea engelmanni, 34.
Tsuga canadensis, 34.
tsugae, tsugae canadensis, 34.
caroliniana, 34.
heterophylla, 34.
Diplodia natalensis, grapefruit, 1.
orange, 1, 18.
peanut, 137.
Diplogaster, Narcissus poeticus, 112.
DIPSACUS FULLONUM, Tylenchus dipsaci, 80.
Dorylaimus sp., Bromus unioloides, 2.
Dothiorella, apple, 119.
Double blossom, blackberry, 3, 4.
dewberry, 4.
Rubus cuneifolia, 4.
floridus, 4.
trivialis, 4.
Downy mildew, see Peronospora, Pseudoperonospora, and cabbage, cantaloupe, cucumber, grape, lima bean, muskmelon, onion, sweet clover, tobacco, tomato, watermelon.
Downy-spot, pecan, 146.
Drought, apple, 118.
Dry rot, corn, 180.
sweet potato, 20.
Dutch elm disease, Ulmus alata, 147
americana, 147.
crassifolia, 147.
Dutch elm disease, Ulmus fulva, 147.
racemosa, 147.
serotina, 147.

E

Ear rot, sweet corn, 174.
Early blight, see celery, potato, tomato.
ECHINOCHLOA CRUS-GALLI, Caconema radicicola, 146.
ELM, Cephalosporium, 125.
Cytospora canker, 125.
Graphium ulmi, 98, 125, 147.
Verticillium wilt, 97.
Erysiphe cichoracearum, muskmelon, 177
polygoni, Astilbe arendsii, 138.
Austrian winter pea, 74.
ESCAROLE, Sclerotinia sclerotiorum, 1.
EUPHORBIA PRESLII, Physalospora sp., 139.
Eutypa ludibunda, Ilex vomitoria, 139.
Ligustrum sp., 139.
Excessive nitrogen, tobacco, 9.
Exoascus deformans, peach, 87, 93, 109, 110, 171.
Exobasidium oxycocci, cranberry, 91.

F

False blossom, cranberry, 93, 154.
Flag smut, wheat, 99.
Foot rot, pea, 174.
sweet potato, 183.
FRAGARIA SP., Tylenchus dipsaci, 80.
CHILOENSIS, Tylenchus dipsaci, 80.
Freezing injury, apple, 46.
peach, 46.
plum, 46.
Frenching, tobacco, 7.
Frog eye, tobacco, 8.
Frog eye leaf spot, apple, 87, 108.
Frost control, cranberry, 93.
Frost injury, celery, 2.
lettuce, 2.
potato, 46.
Fruit rot, cranberry, 93.
FUCHSIA, Phomopsis sp., 138.
FUNKIA, root and crown rot, 148.
Fusarium sp., bean, 173.
lima bean, 173.
peanut, 24.

Fusarium sp., pineapple, 18.
lycopersici, tomato, 144, 153, 174.
martii minus, peanut, 163.
niveum, watermelon, 21.
orthoceras pisi, pea, 174.
oxysporum var. nicotianae, tobacco, 9.
stem end rot, potato, 185.
wilt, tobacco, 9.
tomato, 153.
Fusicladium saliciperdum, willow, 147.

G

GARLIC, Tylenchus dipsaci, 3, 169.
Giberella, barley, 143.
Gloeodes pomigena, apple, 11.
Gloeosporium balsameae, Abies balsamea, 34.
caulivorum, red clover, 89.
nymphaearum, 138.
pini, Pinus ponderosa, 34.
sylvestris, 34.
taeda, 34.
Glomerella cingulata, apple, 162.
Gnomonia leaf spot, see pecan.
Granville wilt, tobacco, 8.
GRAPE, black rot, 13, 111.
downy mildew, 111.
leaf spot, 154.
white rot, 124.
GRAPEFRUIT, Phytophthora citropthora, 130.
stem end-decay, 1.
Graphium ulmi, elm, 98, 125, 147.
Ulmus alata, 147.
americana, 147.
crassifolia, 147.
fulva, 147.
racemosa, 147.
serotina, 147.
GRASS, Sclerotium rhizodes, 105.
Gray bark, raspberry, 48, 172.
Gray mold, potato, 15.
strawberry, 118.
Gray mold rot, pepper, 185.
Guignardia bidwellii, grape, 13, 111.
Gymnosporangium spp., apple, 11.
germinale, apple, 158.
cedar, 72.
Gymnosporangium germinale, Juniperus communis depressa, 108.
globosum, cedar, 133.
juniperi-virginianae, apple, 133, 158.
cedar, 72, 108.

H

Hail injury, wheat, 6.
Halo blight, bean, 88, 165.
Harvest injury, sweet potato, 183.
Hawthorn rust, cedar, 133.
HEDYCHIUM GARDNERIANUM, Caconema radicicola, 137.
Helminthosporium gramineum, barley, 89.
ravenelii, Sporobolus jacquemontii, 155.
Hendersonia desmazieri, Platanus occidentalis, 139.
Hendersonula pinicola, Pinus strobus, 34.
Herpotrichia, 40.
nigra, Abies amabilis, 39.
concolor, 39.
grandis, 39.
lasiocarpa, 39.
nobilis, 39.
Juniperus communis, 39.
Picea engelmanni, 39.
mariana, 39.
pungens, 39.
Pseudotsuga taxifolia, 39.
Taxus brevifolia, 39.
Thuja plicata, 39.
Tsuga mertensiana, 39.
quinquesepta, Picea engelmanni, 40.
Heterosporium laricinum, Larix occidentalis, 34.
HIPPEASTRUM JOHNSONI, Pathoaphelenchus parietinus, 69.
Hollow stalk, tobacco, 8.
HOLLYHOCK, rust, 130.
HYACINTHUS ORIENTALIS, Tylenchus dipsaci, 81.
HYDRANGEA OPULOIDES, Tylenchus dipsaci, 69, 81.
Hydrosis, bean, 165.
HYPOCHAERIS RADICATA, Tylenchus dipsaci, 81.

Hypoderma, 33.
abietis, Abies arizonica, 29.
lasiocarpa, 29.
brachysporum, Pinus excelsa, 29.
strobus, 29.
deformans, Pinus echinata, 29.
edulis, 29.
ponderosa, 29.
f. contorta, Pinus contorta, 29.
hedgcockii, 33.
Pinus caribaea, 29.
clausa, 29.
contorta, 29.
echinata, 29.
palustris, 29.
rigida, 29.
serotina, 29.
taeda, 29.
virginiana, 29.
lethale, Pinus caribaea, 29.
echinata, 29.
nigra austriaca, 30.
pungens, 30.
resinosa, 30.
rigida, 30.
serotina, 30.
taeda, 30.
virginiana, 30.
lineare, Pinus flexilis, 30.
monticola, 30.
strobus, 30.
robustum, Abies amabilis, 30.
concolor, 30.
grandis, 30.
pini, Pinus contorta, 30.
edulis, 30.
flexilis, 30.
monophylla, 30.
Hypodermella, 33.
abietis-concoloris, Abies concolor, 30.
fraseri, 30.
ampla, Pinus banksiana, 30.
contorta, 30.
laricis, 34.
Larix occidentalis, 30.
macrospora, Abies balsamea, 31.
concolor, 31.
grandis, 31.
lasiocarpa, 31.
medusa, Pinus ponderosa, 31.
Hypodermella montivaga, Pinus contorta, 31.
f. contorta, Pinus contorta, 31.
nervisequia, Abies amabilis, 31.
balsamea, 31.
concolor, 31.
fraseri, 31.
grandis, 31.
lasiocarpa, 31.
Picea engelmanni, 31.
mariana, 31.
rubens, 31.
sulcigena, Pinus contorta, 31.
edulis, 31.
flexilis, 31.
monticola, 31.

I

ILEX VOMITORIA, Eutypa ludibunda, 139.
Internal blackening, tomato, 144.
IPOMOEA BATATAS, Tylenchus dipsaci, 81.
IRIS, Pathoaphelenchus fragariae, 68.
root and crown rot, 148.
Tylenchus dipsaci, 68.
XIPHIOIDES, Tylenchus dipsaci, 81.
XIPHIUM, Tylenchus dipsaci, 81.
Isariopsis griseola, bean, 165.

J

Jelly-end rot, potato, 185.
JUNIPERUS SP., Sphaeropsis sp., 41.
COMMUNIS, Coryneum juniperinum, 34.
Herpotrichia nigra, 39.
Lophodermium juniperinum, 32.
Pestalozzia funerea, 35.
COMMUNIS DEPRESSA, quince rust, 108.
MONOSPERMA, Aposphaeria fibricola, 38.
PACHYPHLOEA, Aposphaeria fibricola, 38.
SCOPULORUM, Lophodermium juniperinum, 32.
VIRGINIANA, Microthyrium juniperi, 35.
Pestalozzia funerea, 35.
Valsa canita, 42.

JUNIPERUS VIRGINIANA, Valsa juniperi, 42.

K

Keeping quality, cranberry, 12, 153.
Kuehneola uredinis, raspberry, 49.

L

LARIX SP. Valsa abietis, 41.
AMERICANA, Pestalozzia funerea, 35.
Sphaeropsis ellisii laricis, 41.
DECIDUA, Valsa abietis, 41.
LYALLI, Lophodermium laricis, 32.
OCCIDENTALIS, Collenema sp., 33.
Cytospora abietis, 42.
Heterosporium laricinum, 34.
Hypodermella laricis, 30.
Leptothyrella laricis, 34.
Lophodermium laricinum, 32.
laricis, 32.
Phoma sp., 40.
Valsa abietis, 41.
SIBIRICA, Lophodermium laricinum, 32.
Late blight, see celery, potato, tomato.
LAUREL (CHERRY), winter injury, 147.
Leaf blight, see apple, carrot, muskmelon, onion, tomato.
Leaf blotch, peony, 123.
Leaf curl, peach, 87, 93, 109, 110, 171.
raspberry, 157
Leaf disease, Nymphaea, 148.
Leaf drop, cranberry, 93.
Leaf mold, tomato, 135, 153, 175.
Leaf roll, potato, 104.
Leaf rust, see cereals, oats, raspberry, rye, wheat.
Leafspot, see apple, Austrian winter pea, grape, nasturtium, pea, peanut, raspberry, strawberry, sugar beet, sweet potato, tobacco, tomato.
Leafspot, Brown, pecan, 146.
Leak, potato, 185.
LEDUM GROENLANDICUM, rust, 126.
LEONTODON TARAXACUM, Tylenchus dipsaci, 81.
Leptosphaeria coniothyrium, raspberry, 48.
Leptostroma decipiens, 32.
Leptostromella conigena, Picea excelsa, 40.
Leptothyrella laricis, Larix occidentalis, 34.
Leptothyrium pinastri, Pinus nigra austriaca, 34.
pini, Abies balsamea, 34.
pseudotsugae, Pseudotsuga taxifolia, 34.
stenosporum, Pinus strobus, 35.
LETTUCE, frost injury, 2.
LIGUSTRUM SP., Eutypa ludibunda, 139.
LILIUM REGALE, limber neck, 123.
Phytophthora cactorum, 124.
LIMA BEAN, see bean, lima.
Limber neck, Lilium regale, 125.
LIQUIDAMBAR STYRACIFLUA, Physalospora malorum, 139.
Little peach, peach, 73.
LONG LEAF PINE, Pathoaphelenchus, 3.
Loose smut, barley, 6.
oats, 142.
wheat, 6, 105.
Lophium mytilinum, Pinus rigida, 40.
monticola, 40.
Lophodermium, 33.
abietis, Abies balsamea, 31.
concolor, 31.
grandis, 31.
lasiocarpa, 31.
Picea engelmanni, 31.
mariana, 31.
rubens, 31.
australe, Pinus caribaea, 32.
clausa, 32.
echinata, 32.
muricata, 32.
nigra laricio, 32.
palustris, 32.
pinaster, 32.
resinosa, 32.
rigida, 32.
serotina, 32.
taeda, 32.
virginiana, 32.
decipiens, Pinus ponderosa, 32.

Lophodermium gilvum, Pinus nigra austriaca, 32.
juniperinum, Juniperus communis, 32.
scopulorum, 32.
Lophodermium laricinum, Larix occidentalis, 32.
sibirica, 32.
laricis, Larix lyalli, 32.
occidentalis, 32.
pinastri, 33.
Pinus albicaulis, 33.
banksiana, 33.
contorta, 33.
echinata, 33.
excelsa, 33
flexilis, 33.
jeffreyi, 33.
lambertiana, 33.
monticola, 33.
nigra austriaca, 33.
ponderosa, 33.
pungens, 33.
resinosa, 33.
rigida, 33.
strobus, 33.
sylvestris, 33.
taeda, 33.
virginiana, 33.

M

MACLURA POMIFERA, Stictis mollis, 139.
Trytlidiella rufula, 139.
Macrophoma parca, Abies grandis, 35.
lasiocarpa, 35.
pinea, Pinus montana, 35.
radiata, 35.
taxi, Taxus brevifolia, 35.
Macrophomina phaseoli, snap bean, 138.
Macrosporium carotae, carrot, 176.
cucumerinum, cantaloupe, 136.
muskmelon, 177.
longipes, tobacco, 9.
sarcinula parasiticum, onion, 120.
tomato, tomato, 144.
Magnesium deficiency, tobacco, 9.
MAPLE, Verticillium wilt, 96.
Marsonia juglandis, walnut, 162.
Measles, peony, 122.
MEDICAGO SATIVA, Tylenchus dipsaci, 82.
Melampsora albertensis, Pseudotsuga taxifolia, 37.
Melampsoropsis abietina, spruce, 128.
cassandrae, spruce, 128.
ledicola, spruce, 128.
Melomastia sp., privet, 139.
MELON, Mycosphaerella citrullina, 143.
Microsphaera alni, pecan, 146.
Vaccinium pennsylvanicum nigrum, 155.
Microthyrium juniperi, Juniperus virginiana, 35.
thujae, Thuja plicata, 35.
Mildew, apple, 94.
Austrian winter pea, 74.
onion, 135.
Mollissia pinastri, Pinus rigida, 35.
strobus, 35.
virginiana, 35.
pinicola, Pinus strobus, 35.
Monochaetia pinicola, Pinus echinata, 35.
palustris, 35.
Mosaic, bean, 165, 173.
potato, 121.
raspberry, 48, 120, 156.
tobacco, 6, 7, 16.
tomato, 174, 185.
wheat, 115.
Mosaic, rugose, potato, 104.
Mottle necrosis, sweet potato, 20.
MUSHROOM, bacterial spot, 25.
bruise spot, 25.
Mycogone perniciosa, 25.
Verticillium sp., 25.
MUSKMELON, see also cantaloupe.
downy mildew, 177.
leaf blight, 177.
powdery mildew, 177.
Mycogone perniciosa, mushroom, 25.
Mycosphaerella citrullina, melon, 143.
squash, 152, 176.
watermelon, 177.
fragariae, strawberry, 111, 120.
pinodes, pea, 174.
pomi, apple, 11.
rubi, raspberry, 48, 172.
rubina, raspberry, 48.
taxi, Taxus brevifolia, 35.
thujae, Thuja plicata, 35.
Mytilidion, 40.

N

Nailhead rust, tomato, 144.
NARCISSUS, Aphelenchus subtenuis, 54.
Tylenchus dipsaci, 54. 69.
INCOMPARABILIS, Tylenchus dipsaci, 82.
POETICUS, Cephalobus, 112.
Diplogaster, 112.
root rot, 112.
Tylenchus dipsaci, 82.
pratensis, 112.
POETICUS ORNATUS, Tylenchus dipsaci, 82.
PSEUDONARCISSUS, Tylenchus dipsaci, 82.
TAZETTA, Tylenchus dipsaci, 82.
NASTURTIUM, bacterial leaf spot, 169.
leaf spot, 125.
Nectria sp., Pinus strobus, 40.
cinnabarina, Pinus excelsa, 40.
strobus, 40.
coccinea, Abies balsamea, 40.
pithioides, Pinus monticola, 40.
thujina, Chamaecyparis thyoides, 40.
Needle blight, conifers, 29.
Needle rust, Picea excelsa, 127.
glauca, 127.
albertiana, 127.
mariana, 127.
pungens engelmanni, 127.
spruce, 126.
Nematode, see Aphelenchoides, Aphelenchus, Caconema, Cephalobus, Diplogaster, Dorylaimus, Neotylenchus, Pathoaphelenchus, Tylenchus.
Neopeckia, 40.
coulteri, Pinus albicaulis, 40.
contorta, 40.
flexilis, 40.
monticola, 40.
ponderosa, 40.
strobus, 40.
Neotylenchus abulbosus, Papaver orientale, 55.
NERINE, Aphelenchoides fragariae, 169.
Tylenchus dipsaci, 169.
Nummularia atropunctatum, Quercus velutina, 138.
clypeus, Acacia filiculoides, 139.
NYMPHAEA, leaf disease, 148.
Ovularia nymphaearum, 138.

O

OAK, Caryospora callicarpa, 139.
OATS, covered smut, 142.
leaf rust, 70, 105.
loose smut, 142.
smut, 6, 70, 105, 142, 185.
Ustilago avenae, 70.
Oligostroma acicola, Pinus caribaea, 35.
palustris, 35.
ONION, cold injury, 122.
downy mildew, 120, 135, 167.
leaf blight, 120.
Tylenchus dipsaci, 17, 136.
Urocystis cepulae, 138.
Ophiobolus graminis, wheat, 116.
Ophionectria scolecospora, Pinus contorta, 40.
ponderosa, 40.
rigida, 40.
strobus, 40.
ORANGE, blue mold, 18.
brown rot, 130.
Phytophthora hibernalis, 130.
stem-end decay, 1, 18.
ORANGE, NAVEL, scab, 119.
ORYZA SATIVA, Coconema radicicola, 146.
Ovularia nymphaearum, Nymphaea, 138.
Ovulariella nymphaearum, Nymphaea, 148.
OXALIS SP., Tylenchus dipsaci, 82.

P

PAEONIA OFFICINALIS, Tylenchus dipsaci, 82.
PAPAVER ORIENTALE, Neotylenchus abulbosus, 55.
Pathoaphelenchus, long leaf pine, 3.
sugar cane, 3.
fragariae, iris, 68.
olesistus, 69.
ormerodis, 69.
parietinus, 69.
Prunus unicloides, 2.
Hippeastrum johnsoni, 69.
ribes, 69.
ritzemabosi, 69.
chrysanthemum, 3.
subtenuis, 69.
PEA, bacterial blight, 174.
blight, 174.
foot rot, 174.

PEA, leaf spot, 145.
pod spot, 174.
root rot, 145, 174.
wilt, 174.
PEA, Austrian winter, leafspot, 74.
mildew, 74.
PEACH, bacterial spot, 87, 133.
brown-rot blossom blight, 111.
cracked seed, 119.
freezing injury, 46.
leaf curl, 87, 93, 109, 110, 171.
little peach, 73.
scab, 155.
Verticillium wilt, 132.
winter injury, 87.
yellow leaf, 134.
yellows, 5. 73.
PEANUT, Bacterium solanacearum, 163.
Botrytis sp., 164.
Fusarium sp., 24.
martii minus, 163.
leaf spot, 164.
Pythium sp., 163.
Rhizoctonia sp., 163.
solerotial fungus, 24.
Sclerotium rolfsii, 163, 164.
stem rot, 137.
PEAR, blight, 88, 91, 105, 118, 154.
freezing injury, 46.
scab, 132.
winter injury, 87.
PECAN, brown leaf-spot, 145.
downy-spot, 146.
Gnomonia leaf spot, 146.
powdery mildew, 146.
rosette, 146.
PELTANDRA VIRGINICA, Uromyces caladii, 178.
PENSTEMON, root and crown rot, 148.
Penicillium sp., asparagus, 1.
cherry, 120.
orange, 18.
PEONY, Cladosporium, 123.
leaf blotch, 123.
measles, 122.
PEPPER, gray mold rot, 185.
Peridermium consimile, 128.
strobi, Pinus strobus, 42.
Peronospora hyoscyami, tobacco, 16, 25, 27, 50, 55, 69, 94, 103.
parasitica, cabbage, 153.
Peronospora schleideni, onion, 120, 135, 167.
trifoliorum, sweet clover, 152.
viciae, 138.
Pestalozzia funerea, Juniperus communis, 35.
virginiana, 35,
Larix americana, 35.
Pinus banksiana, 35.
edulis, 35.
montana, 35.
nigra austriaca
ponderosa, 35.
radiata, 35.
resinosa, 36.
rigida, 36.
strobus, 36
sylvestris, 36.
taeda, 36.
Taxodium distichum, 36.
Taxus baccata, 36.
Thuja occidentalis, 36.
plicata, 36.
peregrina, Pinus echinata, 36.
nigra austriaca, 36.
palustris, 36.
strobus, 36.
Pezizella minuta, Pinus echinata, 36.
rigida, 36.
strobus, 36.
taeda, 36.
virginiana, 36.
Phacidium abietinellum, Abies balsamea, 36.
balsameae, Abies concolor, 36.
lasiocarpa, 36.
convexum, Pinus rigida, 36.
expansum, Picea mariana, 36.
infestans, Pseudotsuga taxifolia, 36.
abietis, Abies concolor, 36.
grandis, 36.
lasiocarpa, 36.
planum, Pinus flexilis, 36.
strobus, 36.
Phaeophacidium abietinum, Abies grandis, 40.
PHLOX, root and crown rot, 148.
Tylenchus dipsaci, 69.
DECUSSATA, Aphelenchoides fragariae, 137.
Tylenchus dipsaci, 83, 137.

PHLOX PANICULATA, Tylenchus dipsaci, 83.
Phoma sp., Abies balsamea, 40.
concolor, 40.
Larix occidentalis, 40.
Picea sp., 37.
excelsa, 37, 40.
mariana, 37.
Pinus rubens, 40.
Pseudotsuga taxifolia, 37.
abietis, Abies grandis, 37.
acicola, Pinus Montana mughus, 37.
monticola, 37.
apiicola, celery, 1.
conorum, Picea engelmanni, 41.
Pinus mariana, 41.
douglasii, Pseudotsuga taxifolia, 41.
eguttatulata, Pinus ponderosa, 37.
hystrella, Taxus brevifolia, 37.
lineolatum, Picea engelmanni, 41.
lingam, cabbage, 178.
cauliflower, 178.
pectinata, Abies pectinata, 37.
root rot, celery, 1.
rot, sugar beet, 185.
strobiligena, Picea excelsa, 41.
Pinus strobus, 41.
virginiana, 41.
Phomopsis, 41.
Fuchsia, 138.
citri, grapefruit, 1.
orange, 1, 18.
Phyllosticta, sweet potato, 183.
solitaria, apple, 11.
Phymatotrichum omnivorum, alfalfa, 75.
Physalospora sp., Euphorbia preslii, 139.
cydoniae, apple, 87.
malorum, apple, 11, 108.
Canna indica, 139.
Liquidambar styraciflua, 139.
Sassafras variifolium, 139.
Physarum sp., sweet potato, 111.
Phytomonas medicaginis phaseolicola, bean, 165.
phaseoli, bean, 165.
Phytophthora cactorum, Lilium regale, 124.
citrophthora, grapefruit, 130.
orange, 130.
Phytophthora hibernalis, orange, 130.
infestans, potato, 14, 21, 45, 121, 145.
tomato, 166, 176, 184.
nicotianae, tobacco, 9.
phaseoli, lima bean, 173.
terrestris, tomato, 175.
PICEA SP., Ascochyta piniperda, 39.
Phoma sp., 37.
Valsa abietis, 41.
ENGELMANNI, Chilonectria cucurbitula, 39.
Dimerosporium balsamicola, 34.
Herpotrichia nigra, 39.
quinquesepta, 40.
Hypodermella nervisequia, 31.
Lophodermium abietis, 31.
Phoma conorum, 41.
lineolatum, 41.
EXCELSA, Leptostromella conigena, 40.
needle rust, 127.
Phoma sp., 37. 40.
strobiligena, 41.
Sphaeropsis pinastri f. abietis 41.
Valsa pini, 42.
GLAUCA, needle rust, 127.
ALBERTIANA, needle rust, 127.
MARIANA, Chilonectria cucurbitula, 39.
Herpotrichia nigra, 39.
Hypodermella nervisequia, 31.
Lophodermium abietis, 31.
needle rust, 127.
Phacidium expansum, 36.
Phoma sp., 37.
Valsa abietis, 41.
pini, 42.
PUNGENS, Herpotrichia nigra, 39.
ENGELMANNI, needle rust, 127.
RUBENS, Hypodermella nervisequia, 31.
Lophodermium abietis, 31.
Phoma sp., 40.
PINEAPPLE, black rot, 18.
Fusarium sp., 18.
PINUS ALBICAULIS, Neopeckia coulteri, 40.
Lophodermium pinastri, 33.
ATTENUATA, Septoria acicola, 38.
BANKSIANA, Hypodermella ampla, 30.

PINUS BANKSIANA, Lophodermium pinastri, 33.
pestalozzia funerea, 35.
Sclerophoma pini, 37.
Valsa superficialis, 42.
CARIBAEA, Asterina pinastri, 33.
Hypoderma hedgcockii, 29.
lethale, 29.
Lophodermium australe, 32.
Oligostroma acicola, 35.
Septoria acicola, 38.
CLAUSA, Hypoderma hedgcockii, 29.
Hophodermium australe, 32.
CONTORTA, Coryneum cinereum, 33.
Cytospora pini, 42.
Hypoderma deformans f. contorta, 29.
hedgcockii, 29.
robustum pini, 30.
Hypodermella ampla, 30.
montivaga, 31.
f. contorta, 31.
sulcigena, 31.
Lophodermium pinastri, 33.
Neopeckia coulteri, 40.
Ophionectria scolecospora, 40.
Sclerophoma pityophila, 38.
Septonema atrum, 38.
Valsa abietis, 41.
ECHINATA, Asterina pinastri, 33.
Hypoderma deformans, 29.
hedgcockii, 29.
lethale, 29.
Lophodermium australe, 32.
pinastri, 33.
Monochaetia pinicola, 35.
Pestalozzia peregrina, 36.
Pezizella minuta, 36.
Septoria acicola, 38.
Sphaeropsis ellisii, 41.
EDULIS, Hypoderma deformans, 29.
robustum pini, 30.
Hypodermella sulcigena, 31.
Pestalozzia funerea, 35.
EXCELSA, Coccomyces pini, 39.
Hypoderma brachysporum, 29.
Lophodermium pinastri, 33.
Nectria cinnabarina, 40.
Sphaeropsis ellisii, 41.
Valsa pini, 42.
FLEXILIS, Hypoderma lineare, 30.
PINUS FLEXILIS, Hypoderma robustum pini, 30.
Hypodermella sulcigena, 31.
Lophodermium pinastri, 33.
Neopeckia coulteri, 40.
Phacidium planum, 36.
Sclerophoma pityophila, 38.
Sphaeropsis ellisii, 41.
Valsa curreyi, 42.
GLABRA, Septoria acicola, 38.
JEFFREYI, Lophodermium pinastri, 33.
LAMBERTIANA, Lophodermium pinastri, 33.
MARIANA, Phoma conorum, 41.
MONOPHYLLA, Hypoderma robustum pini, 30.
MONTANA, Macrophoma pinea, 35.
Pestalozzia funerea, 35.
MUGHUS, Phoma acicola, 37.
Septoria acicola, 38.
MONTICOLA, Coccomyces pini, 39.
Cytospora pini, 42.
Hypoderma lineare, 30.
Hypodermella sulcigena, 31.
Lophium mytilinum, 40.
Lophodermium pinastri, 33.
Nectria pithioides, 40.
Neopeckia coulteri, 40.
Phoma acicola, 37.
Sclerophoma pini, 37.
pityophila, 38.
MURICATA, Lophodermium australe, 32.
Sphaeropsis ellisii, 41.
NIGRA AUSTRIACA, Chilonectria cucurbitula, 39.
Hypoderma lethale, 30.
Leptothryium pinastri, 34.
Lophodermium gilvum, 32.
pinastri, 33.
Pestalozzia funerea, 35.
peregrina, 36.
Septoria acicola, 38.
Sphaeropsis ellisii, 41.
LARICIO, Lophodermium australe, 32.
PALUSTRIS, Hypoderma hedgcockii, 29.
Lophodermium australe, 32.
Monochaetia pinicola, 35.
Oligostroma acicola, 35.

PINUS PALUSTRIS, Pestalozzia peregrina, 36.
Septoria acicola, 38.
PINASTER, Lophodermium australe, 32.
Septoria acicola, 38.
PINEA, Sphaeropsis ellisii, 41.
PONDEROSA, Asterina pinastri, 33.
Cytospora abietis, 42.
Gloeosporium pini, 34.
Hypoderma deformans, 29.
Hypodermella medusa, 31.
Lophodermium decipiens, 32.
pinastri, 33.
Neopeckia coulteri, 40.
Ophionectria scolecospora, 40.
Pestalozzia funerea, 35.
Phoma eguttalulata, 37.
Sclerophoma pini, 37.
Septoria acicola, 38.
Valsa pini, 42.
PUNGENS, Caliciopsis pinea, 39.
Hypoderma lethale, 30.
Lophodermium pinastri, 33.
RADIATA, Macrophoma pinea, 35.
Pestalozzia funerea, 35.
Sphaeropsis ellisii, 41.
RESINOSA, Coleosporium solidaginis, 178.
Hypoderma lethale, 30.
Lophodermium australe, 32.
pinastri, 33.
Pestalozzia funerea, 36.
Sphaeropsis ellisii, 41.
RIGIDA, Asterina pinastri, 33.
Caliciopsis pinea, 39.
Chilonectria cucurbitula, 39.
Hypoderma hedgcockii, 29.
lethale, 30.
Lophium mytilinum, 40.
Lophodermium australe, 32.
pinastri, 33.
Mollissia pinastri, 35.
Ophionectria scolecospora, 40.
Pestalozzia funerea, 36.
Pezizella minuta, 36.
Phacidium convexum, 36.
Septoria acicola, 38.
Sphaeropsis ellisii, 41.
PINUS RIGIDA, Valsa abietis, 41.
SEROTINA, Hypoderma hedgcockii, 29.
lethale, 30.
Lophodermium australe, 32.
Septoria acicola, 38.
pinicola, 38.
SONDEREGII, Septoria acicola, 38.
STROBUS, Aposphaeria pinea, 38.
Asterina pinastri, 33.
Caliciopsis pinea, 39.
Chilonectria cucurbitula, 39.
Coccomyces pini, 39.
Cytospora pinastri, 39.
Hendersonula pinicola, 34.
Hypoderma brachysporum, 29.
lineare, 30.
Leptothyrium stenosporum, 35.
Lophodermium pinastri, 33.
Mollissia pinastri, 35.
pinicola, 35.
Nectria sp., 40.
cinnabarina, 40.
Neopeckia coulteri, 40.
Ophionectria scolecospora, 40.
Peridermium strobi, 42.
Pestalozzia funerea, 36.
peregrina, 36.
Pezizella minuta, 36.
Phacidium planum, 36.
Phoma strobiligena, 41.
Sclerophoma pini, 37.
Septoria spadicea, 38.
Sphaeropsis ellisii, 41.
Valsa abietis, 41.
kunzei, 42.
pini, 42.
SYLVESTRIS, Cytospora pinastri, 39.
Gloeosporium pini, 34.
Lophodermium pinastri, 33.
Pestalozzia funerea, 36.
Sclerophoma pini, 37.
Sphaeropsis ellisii, 41.
TAEDA, Asterina pinastri, 33.
Gloeosporium pini, 34.
Hypoderma hedgcockii, 29.
lethale, 30.
Lophodermium australe, 32.
pinastri, 33.
Pestalozzia funerea, 36.
Pezizella minuta, 36.
Septoria acicola, 38.
pinicola, 38.

PINUS VIRGINIANA, Calicioopsis pinea, 39.
Chilonectria cucurbitula, 39.
Hypoderma hedgcockii, 29.
lethale, 30.
Lophodermium australe, 32.
pinastri, 33.
Mollissia pinastri, 35.
Pezizella minuta, 36.
Phoma strobiligena, 41.
Septoria acicola, 38.
pinicola, 38.
Valsa pini, 42.
PLANTAGO LANCEOLATA, Tylenchus dipsaci, 83.
MARITIMA, Tylenchus dipsaci, 83.
Plasmopara viticola, grape, 111.
PLATANUS OCCIDENTALIS, Hendersonia desmazieri, 139.
Plectodiscella veneta, dewberry, 13.
raspberry, 172.
Pleospora rot, tomato, 185.
Plowrightia morbosa, plum, 120.
PLUM, black knot, 120.
freezing injury, 46.
Pock, sweet potato, 20.
Pod blight, lima bean, 173.
Pod spot, pea, 174.
Podosphaera leucotricha, apple, 94, 113.
POLYGONUM LAPATHIFOLIUM, Caconema radicicola, 146.
PONTEDERIA CORDATA, Uromyces pontederiae, 178.
Posters, vegetable diseases, 169.
Potash hunger; tobacco, 9.
POTATO, black leg, 73, 121.
brown rot, 121.
brown sprout, 104.
cold injury, 122.
Corticium vagum, 121.
early blight, 45, 121, 136.
frost injury, 46.
Fusarium stem-end rot, 185.
gray mold, 15.
jelly-end rot, 185.
late blight, 14, 21, 45, 121, 145, 176.
leaf roll, 104.
leak, 185.
mosaic, 121.
powdery scab, 166.
POTATO, psyllid yellows, 136.
root-knot, 2.
rugose mosaic, 104.
scab, 121, 136.
southern wilt, 121.
spindle tuber, 18.
Tylenchus pratensis, 69.
virus diseases, 104, 121.
wilt, 185.
yellow dwarf, 121.
Powdery mildew, see apple, muskmelon, pecan, raspberry.
Powdery scab, potato, 166.
Pox, sweet potato, 183.
PRIMULA OBCONICA, Tylenchus dipsaci, 83.
PRAENITENS, Tylenchus dipsaci, 83.
PRIVET, Melomastia sp., 139.
Sphaeropsis malorum, 139.
PRUNUS AMERICANA, Tranzschelia punctata, 155.
Pseudoperonospora cubensis, cucumber, 152, 177.
muskmelon, 177.
watermelon, 177.
Pseudopeziza ribis, Ribes spp., 117.
PSEUDOTSUGA TAXIFOLIA, Cryptosporium candidum, 39.
Cytospora abietis, 42.
Herpotrichia nigra, 39.
Leptothyrium pseudotsugae, 34.
Melampsora albertensis, 37.
Phacidium infestans, 36.
Phoma sp., 37.
douglasii, 41.
Rhabdocline pseudotsugae, 37.
Rhabdogloeum pseudotsugae, 37.
Valsa abietis, 41.
Psyllid yellows, potato, 136.
Puccinia spp., cereals, 89.
antirrhini, snapdragon, 125.
coronata, oats, 70, 105.
dispersa, rye, 6, 70.
graminis, wheat, 6.
malvacearum, hollyhock, 130.
saccobati, sugar beet, 136.
triticina, wheat, 6, 70, 105.
Pucciniastrum americanum, raspberry, 49, 172.
PYRETHRUM, root and crown rot, 148.
Pythium sp., peanut, 163.

Q

QUERCUS VELUTINA, Nummularia atropunctatum, 138.
QUINCE, blight, 154.
Quince rust, apple, 158.
cedar, 72.
Juniperus communis depressa, 108.

R

RADISH, black root, 137.
RASPBERRY, anthracnose, 172.
cane blight, 48.
gray bark, 48, 172.
leaf curl, 157.
leaf rust, 49, 172.
leaf spot, 48.
Mosaic, 48, 120, 156.
powdery mildew, 134.
Septoria leaf spot, 172.
spur blight, 48.
streak, 120, 157.
surface mildew, 47.
virus diseases, 48, 156.
Rehmiellopsis bohemica, Abies concolor, 168.
Rhabdocline pseudotsugae, Pseudotsuga taxifolia, 37.
Rhabdogloeum abietinum, Abies fraseri, 37.
pseudotsugae, Pseudotsuga taxifolia, 37.
Rhizoctonia sp., bean, 173.
lima bean, 173.
peanut, 163.
tobacco, 16.
tomato, 144.
solani, potato, 104.
violacea, alfalfa, 75.
sugar beet, 75.
sweet potato, 74.
RIBES SPP., anthracnose, 117.
Root and crown rot, aconite, 148.
Delphinium, 148.
Funkia, 148.
iris, 148.
Penstemon, 148.
phlox, 148.
Pyrethrum, 148.
Valeriana, 148.
Root knot, see bean, Caconema radicicola, Coronilla varia, lima bean, potato, tobacco.
Root rot, bean, 173.
lima bean, 173.
Narcissus poeticus, 112.
pea, 145, 174.
sweet corn, 174.
ROSE, bud blight, 137.
Coniothyrium diplodiella, 124.
Rose bloom, cranberry, 92.
Rosette, pecan, 146.
RUBUS CUNEIFOLIA, double blossom, 4.
FLORIDUS, double blossom, 4.
TRIVIALIS, double blossom, 4.
Russet, apple, 11, 131.
Rust, see Andromeda glaucophylla, apple, carnation, Chamaedaphne calyculata, hollyhock, Ledum groenlandicum, snap dragon, Vicia faba.
RYE, anthracnose, 50.
leaf rust, 6, 70.

S

Sand drown, tobacco, 9.
SASSAFRAS VARIIFOLIUM, Physalospora malorum, 139.
Scab, apple, 10, 11, 22, 47, 71, 86, 94, 106, 165.
barley, 143.
navel orange, 119.
peach, 155.
pear, 132.
potato, 121, 136.
SCILLA SP., Tylenchus dipsaci, 169.
SIBIRICA, Tylenchus dipsaci, 169.
Sclerophoma pini, Pinus banksiana, 37.
monticola, 37.
ponderosa, 37.
strobus, 37.
sylvestris, 37.
pityophila, Pinus contorta, 38.
flexilis, 38.
monticola, 38.

Sclerotial fungus, undet., peanut, 24.
Sclerotinia fructicola, apple, 184.
cherry, 120.
peach, 111.
sclerotiorum, escarole, 1.
zinnia, 168.
trifoliorum, alfalfa, 89.
clover, 24.
red clover, 89.
Sclerotium delphinii, aconite, 148.
Delphinium, 148.
Funkia, 148.
iris, 148.
Penstemon, 148.
phlox, 148.
Pyrethrum, 148.
Valeriana, 148.
rhizodes, grass, 105.
rolfsii, bean, 88.
peanut, 163, 164.
potato, 121.
tobacco, 8.
Scurf, sweet potato, 20, 183.
Septonema atrum, Pinus contorta, 38.
Septoria spp., celery, 177.
sweet potato, 183.
acicola, 35, 36.
Pinus attenuata, 38.
caribaea, 38.
echinata, 38.
glabra, 38.
montana mughus, 38.
nigra austriaca, 38.
palustris, 38.
pinaster, 38.
ponderosa, 38.
rigida, 38.
serotina, 38.
sonderegii, 38.
taeda, 38.
virginiana, 38.
apii, celery, 178.
apii-graveolentis, celery, 177.
leaf spot, raspberry, 172.
lycopersici, tomato, 144, 153, 174.
pinicola, Pinus serotina, 38.
taeda, 38.
virginiana, 38.
rubi, raspberry, 48.
spadicea, Pinus strobus, 38.
Smut, see corn, oats, sweet corn.
SNAP BEAN, see bean.
SNAPDRAGON, rust, 125.
wilt, 111.
Soft rot, sweet potato, 20, 183.
Soft scald, apple, 18.
Soluble salt injury, 135.
sooty blotch, apple, 11.
Sore-shin, tobacco, 8.
Southern wilt, potato, 121.
Sphacelotheca seymouriana, Andropogon virginicum, 138.
Sphaerella canadensis, Thuja plicata, 38.
conicola, Tsuga canadensis, 38.
taxodii, Taxodium distichum, 38.
Sphaeropsis sp., Juniperus sp., 41.
Thuja sp., 41.
ellisii, Pinus echinata, 41.
excelsa, 41.
flexilis, 41.
muricata, 41.
nigra austriaca, 41.
pinea, 41.
radiata, 41.
resinosa, 41.
rigida, 41.
strobus, 41.
sylvestris, 41.
laricis, Larix americana, 41.
malorum, apple, 119.
privet, 139.
pinastri f. abietis, Picea excelsa, 41.
Sphaerotheca humuli, raspberry, 47.
Spindle tuber, potato, 18.
Spongospora subterranea, potato, 166.
SPOROBOLUS JACQUEMONTII, Helminthosporium ravenelii, 155.
SPRUCE, Melampsoropsis abietina, 128.
cassandrae, 128.
ledicola, 128.
SPRUCE, needle rust, 126.
SPRUCE, BLUE, Cytospora canker, 155.
Spur blight, raspberry, 48.
SQUASH, bacterial leaf spot, 176.
black rot, 152, 176.
cold injury, 122.
Stalk rot, sweet corn, 174.
Stem canker, apple, 178.
Stem-end decay, grapefruit, 1.
orange, 1, 18.

Stem nema, see Tylenchus dipsaci.
Stem rot, see bean, peanut, red clover, tobacco, zinnia.
Stem rust, wheat, 6.
STERCULIA PLATANIFOLIA, Botryosphaeria ribis, 138.
Stictis mollis, Maclura pomifera, 139.
Stinking smut, wheat, 6, 56-67, 105, 181, 182.
STONE FRUITS, bacterial gummosis, 133.
STRAWBERRY, Aphelenchoides fragariae, 113.
gray mold, 118.
leaf spot, 111, 120.
Streak, raspberry, 120, 157.
tomato, 185.
Stripe, barley, 89, 185.
SUGAR BEET, leaf spot, 185.
Phoma rot, 185.
Puccinia sarcobati, 136.
violet root rot, 75.
SUGAR CANE, Pathoaphelenchus, 3.
Sun-scald, tomato, 175.
Surface mildew, raspberry, 47.
Surface rot, sweet potato, 20.
SWEET CLOVER, downy mildew, 152.
SWEET CORN, Bacterial wilt, 104, 114, 140, 167, 174, 179.
Bacterium dissolvens, 142.
ear rot, 174.
root rot, 174.
smut, 174.
stalk rot, 174.
SWEET POTATO, black rot, 20, 183.
blue stem, 183.
charcoal rot, 20.
dry rot, 20.
foot rot, 183.
harvest injury, 183.
leaf spot, 183.
mottle necrosis, 20.
Phyllosticta, 183.
Physarum sp., 111.
pock, 20.
pox, 183.
scurf, 20, 183.
Septoria, 183.
soft rot, 20, 183.
surface rot, 20.
violet root rot, 74.
white rust, 183.

T

Take-all, wheat, 116.
TAXODIUM DISTICHUM, Pestalozzia funerea, 36.
Sphaerella taxodii, 38.
TAXUS BACCATA, Pestalozzia funerea, 36.
BREVIFOLIA, Herpotrichia nigra, 39.
Macrophoma taxi, 35.
Mycosphaerella taxi, 35.
Phoma hystrella, 37.
Thielavia basicola, tobacco, 7, 9.
Thielaviopsis paradoxa, pineapple, 18.
THUJA SP., Sphaeropsis sp., 41.
OCCIDENTALIS, Cytospora thujae, 42.
Pestalozzia funerea, 36.
Valsa abietis, 41.
thujae, 42.
PLICATA, Coryneum thujinum, 34.
Cytospora weiriana, 42.
Herpotrichia nigra, 39.
Microthyrium thujae, 35.
Mycosphaerella thujae, 35.
Pestalozzia funerea, 36.
Sphaerella canadensis, 38.
Valsa abietis, 41.
weiriana, 42.
Thyridaria eutypoides, Broussonetia papyrifera, 139.
Tilletia sp., wheat, 6, 56-67, 105, 181, 182.
levis, wheat, 181.
tritici, wheat, 181.
Tip wilt, asparagus, 167.
TOBACCO, angular leaf spot, 6, 8, 90.
bacterial leaf spots, 145.
black root rot, 7.
black shank, 9.
brown root, 9.
cherry-red leaf, 9.
cold injury, 90.
damping-off, 16.
downy mildew, 16, 25, 27, 50, 55, 69, 94, 103.
excessive nitrogen, 9.
frenching, 7.
frog eye, 8.
Fusarium wilt, 9.
Granville wilt, 8.

TOBACCO, hollow stalk, 8.
leaf spot, 9, 145.
magnesium deficiency, 9.
mosaic, 6, 7, 16.
potash hunger, 9.
root knot, 8, 16.
sand drown, 9.
sore-shin, 8.
stem rot, 8.
Thielavia basicola, 9.
wildfire, 90, 96, 122.
TOMATO, bacterial canker, 121, 144, 174, 175.
bacterial spot, 103, 121, 144, 174.
blossom-end rot, 144, 175.
buckeye rot, 175.
center rot, 151.
cloudy spot, 167.
cold injury, 122.
collar rot, 175.
curly top, 136.
damping-off, 175.
downy mildew, 176.
early blight, 144, 174, 175.
Fusarium wilt, 153.
internal blackening, 144.
late blight, 166, 176, 184.
leaf blight, 144.
leaf mold, 135, 153, 175.
leaf spot, 174.
mosaic, 174, 185.
nailhead rust, 144.
Pleospora rot, 185.
Rhizoctonia, 144,
streak, 185.
sun-scald, 175.
western yellow blight, see curly top.
wilt, 144, 174, 175.
Tranzschelia punctata, Prunus americana, 155.
TRIFOLIUM INCARNATUM, Tylenchus dipsaci, 85.
PRATENSE, Tylenchus dipsaci, 85.
REPENS, Tylenchus dipsaci, 85.
Tryblidiella rufula, Maclura pomifera, 139.
TSUGA CANADENSIS, Coryneum cupulatum, 39.
Cytospora curreyi, 42.
Dimerosporium balsamicola, 34.
tsugae, 34.
TSUGA CANADENSIS, Sphaerella conicola, 38.
Valsa abietis, 41.
CAROLINIANA, Dimerosporium tsugae, 34.
HETEROPHYLLA, Dimerosporium tsugae, 34.
MERTENSIANA, Herpotrichia nigra, 39.
Tubercularia vulgaris, Albizzia julibrissin, 138.
Tylenchus dipsaci, see also pp. 76-85, Index of hosts known to be affected in continental U. S.
alfalfa, 2.
Bromus unioloides, 2.
Chionodoxa, 169.
Colchicum speciosum album, 146.
garlic, 3, 169.
Hydrangea opuloides, 69.
iris, 68.
narcissus, 54, 69.
nerine, 169.
onion, 17, 136.
phlox, 69.
decussata, 137.
Scilla sp., 169.
sibirica, 169.
pratensis, cyclamen, 17.
Narcissus poeticus, 112.
potato, 69.
tritici, wheat, 6, 17.

U

ULMUS ALATA, Dutch elm disease, 147.
AMERICANA, Dutch elm disease, 147.
CRASSIFOLIA, Dutch elm disease, 147.
FULVA, Dutch elm disease, 147.
RACEMOSA, Dutch elm disease, 147.
SEROTINA, Dutch elm disease, 147.
Urocystis agropyri, Agropyron repens, 138.
cepulae, onion, 138.
Uromyces caladii, 178.
Peltandra virginica, 178.
caryophyllinus, carnation, 184.
fabae, Vicia faba, 74.
pontederiae, Pontederia cordata, 178.

Ustilago spp., oats, 105.
avenae, oats, 6, 70, 142.
bromivora, Bromus unioloides, 111.
hordei, barley, 6, 70.
levis, oats, 6, 142.
nuda, barley, 6.
residua, Danthonia spicata, 111.
tritici, wheat, 6, 70, 99, 105.
zeae, sweet corn, 174.

V

VACCINIUM PENNSYLVANICUM NIGRUM,
Microsphaera alni, 155.
VALERIANA, root and crown rot, 148.
Valsa, conifers, 42.
abietis, Abies balsamea, 41.
grandis, 41.
lasiocarpa, 41.
Chamaecyparis thyoides, 41.
Larix sp., 41.
decidua, 41.
occidentalis, 41.
Picea sp., 41.
mariana, 41.
Pinus contorta, 41.
rigida, 41.
strobus, 41.
Pseudotsuga taxifolia, 41.
Thuja occidentalis, 41.
plicata, 41.
canadensis, 41.
brevis, Abies balsamea, 42.
canita, Juniperus virginiana, 42.
curreyi, Pinus flexilis, 42.
juniperi, Juniperus virginiana, 42.
kunzei, Pinus strobus, 42.
pini, Abies balsamea, 42.
grandis, 42.
Picea excelsa, 42.
mariana, 42.
Pinus ponderosa, 42.
strobus, 42.
virginiana, 42.
superficialis, Pinus banksiana, 42.
thujae, Thuja occidentalis, 42.
weiriana, Thuja plicata, 42.
Venturia inaequalis, apple, 11, 22, 47, 71, 86, 94, 106.
pyrina, pear, 132.
Vermicularia compacta, dahlia, 139.
Verticillium sp., mushroom, 25.
alboatrum, 111.
peach, 132.
ovatum, tomato, 175.
wilt, Ailanthus, 97.
elm, 97.
maple, 96.
peach, 132.
VICIA SP., Ascochyta viciae, 137.
FABA, rust, 74.
Violet root rot, alfalfa, 75.
coralberries, 74.
sugar beet, 75.
sweet potato, 74.
Virus diseases, potato, 104.
raspberry, 48, 156.
Volutella buxi, box, 138.

W

WALNUT, blotch, 162.
WATERMELON, anthracnose, 22, 177.
cold injury, 122.
cracking, 22.
downy mildew, 177.
Fusarium wilt, 22.
Mycosphaerella citrullina, 177.
wilt, 21.
Western yellow blight, tomato, 136.
WHEAT, bunt, see stinking smut.
covered smut, see stinking smut.
flag smut, 99.
hail injury, 6.
leaf rust, 6, 70.
loose smut, 6, 70, 105.
mosaic, 115.
stem rust, 6.
stinking smut, 6, 56-67, 105, 181, 182.
take-all, 116.
Tylenchus tritici, 6, 17.
White rot, grape, 124.
White rust, sweet potato, 183.
Wildfire, tobacco, 90, 96, 122.
WILLOW, Fusicladium saliciperdum, 147.
scab, 147.
Wilt, see pea, potato, snapdragon, tomato, watermelon.
Winter injury, cherry laurel, 147.
peach, 87.
pear, 87.

Y

Yellow dwarf, potato, 121.
Yellow leaf, barley, 89.
peach, 134.
Yellows, aster, 130, 169.
Yellows, celery, 18.
peach, 5, 73.

Z

ZINNIA, stem rot, 168.